

Android

Android system

- Android is a large software bundle on top of Linux
- In some sense it is a special Linux distro
- However, it is very different from ordinary Linux distro: no command line, no tools, no X-windows, no server software, etc

Creating Android apps

- Normal native Android apps are written in Java
- They are distributed as packaged .apk files
- Conventional Java language, but:
 - The virtual machine is not the Oracle/Sun Java virtual machine, but the Google virtual machine
 - The libraries are different: a lot of stuff specially for Android

Other ways to create apps

- Links to html pages can be stored as an „app icon“ on home screen: a „html5“ app is basically a link to a web page optimized for mobile
- You can also use C for internals, but not for UI
- Lots of special tools for „simplified“ creation of apps.

Caution!

- The hard part is to install all the tools
- After you manage to run Hello World, everything becomes easier

Android developer site

- <http://developer.android.com/>
- A **lot** of tools: initially a bit overwhelming
- Use in this order:
 - Workflow overview
<http://developer.android.com/tools/workflow/>
 - Tools: <http://developer.android.com/tools/>
 - Downloads: <http://developer.android.com/sdk/>
 - Training: <http://developer.android.com/training/>

How to start?

- Install the required dev environment
 - Java SE
 - Eclipse
 - Android SDK (integrates with eclipse)
 - Start/test the phone simulator (part of SDK)
- Compile using Android tools under Eclipse
- Run under simulator (under Eclipse)
- Eventually, copy to your own phone and test
- Finally publish to store or distribute yourself

Do I need Eclipse?

- Technically, not
- You can develop with Android SDK **on command line** and run the simulator without Eclipse
- You can also experiment with the Google **Android Studio** IDE based on IntelliJ:
<http://developer.android.com/sdk/installing/studio.html>

Alternative: Eclipse+SDK combo

- Check
<http://developer.android.com/sdk/>
- Left menu: „Setting Up the ADT Bundle“
- This downloads Eclipse+Android SDK combined
- No need if you already have eclipse
- A good alternative otherwise

Back to Java and Eclipse

- Most probably you already have done this:

- Install Java JDK

<http://www.oracle.com/technetwork/java/javase/downloads/index.html>

(not JRE, no Netbeans, no server)

- Download and unpack Eclipse

<http://www.eclipse.org/downloads/>

- Version „Eclipse IDE for Java Developers“

Remember whether 32 or 64 bit version!

Android SDK for java

- Go to <http://developer.android.com/sdk/>
- Click „Use an Existing IDE“ below on page
- Click „Download the SDK tools ...“ button appearing
- Accept licence and download
- Start the downloaded program
- Opens a wizard with a dialogue
- Click through
- Downloads
- Starts an „SDK manager“ upon finish

... Android SDK continued

- Installer starts a new program eventually: Android SDK manager:
 - You have to choose which tools/versions to really download! Initially confusing ...
 - You need top rows of „Tools“
 - Choose several **Android versions** below

Which Android versions?

- Take the latest just for fun
- Then take the one for **YOUR** phone
- Take also some earlier, like 2.3.3
- Tick stuff **under** selected version
- **No need** for Intel x86 Atom system image
- **Extras:**
 - Google USB driver
 - Android support library?
 - Probably do not need more

Continued ...

- Accept licence and click through until starts downloading
- Downloads **a lot**: this takes time
- Finally says „OK“ and not much happens

Eclipse and the Android simulator

- Your Eclipse should now have Android plugins installed
- Let us check out the simulator in Eclipse
- Open Eclipse -> Window -> Android Virtual Device Manager
- Click „new“
- A window opens with a lot to select!

Simulator options

- Important stuff:
 - Select device: take your own, for example
 - Select target Android version: take one of these you have downloaded for SDK before
 - Increase Internal Storage
- Otherwise defaults should be OK

Running the simulator

- Back to „Android Virtual Device Manager“
- Select one „virtual device“ with green tick
- Press „Start“
- Click through
- Launch
- If you are lucky: opens a new window!
- If not: try other simulator options, like „Android Version“, screen resolutions etc until you find a combo which works ok

The simulator window

- A proper simulated Android in a PC
- Try it out: works!
- Beware! It is **painfully slow**
- Even just starting up the simulator window may take minutes
- However, you **can** debug on a real Android phone, with debugging output on PC and app running on phone

Creating Hello World

- Open Eclipse
- File -> new -> Android application project
- Select name and Android version
- Click through option screens: defaults are sensible
- Finally a full empty Hello World application is created automatically!

Running Hello World

- Click the green right arrow in Eclipse upper icons bar. This happens:
 - App is compiled
 - Simulator is started (this is slow!)
 - Unlock Android screen on simulator
 - Your Hello world app is run!
 - Your Hello world is set up as a proper app in the simulated Android app screen

Exploring samples

- If you did not download samples, do it now using the SDK manager
- In Eclipse Package explorer menu on left:
 - Right-click
 - New->Other (down below) -> Android Sample Project
 - Select Android version
 - Select sample
 - When sample is open, compile & run it with the green arrow in the Eclipse iconbar

Start to learn app development

- <http://developer.android.com/training/basics/firstapp/>